

Title: Geodatabase Synthesis of 9496 COVID-19 Treatment Centers in India

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Conflicts of Interest:

None

Background:

Access to healthcare is a multifaceted concept with geographic accessibility to healthcare facilities being a critical component. We created a database of geolocations of the COVID-19 treatment centres for a more refined analysis of health access that can help identify inequalities in COVID-19 treatment accessibility in India.

Methods:

The data was sourced from covidIndia.org (now archived) and the Ministry of Health and Family Welfare (MoHFW) resource list that directed users to COVID-dedicated state-level websites. The data available up to May 2021 was extracted, compiled in a single spreadsheet and organised based on states and types of centres. Centre locations were geocoded using the Google Maps API tool, Awesome Tables add-on and Selenium. Some entries were manually geocoded as well. The accuracy of the API-derived coordinates was noted as per Rooftop, Geometric Centre and Approximate - in decreasing precision. The data was further cleaned by removing the duplicates based on the COVID-19 centre name and address. The COVID centres geocoded using the API tools were cross-verified by manually geocoding 10% of the randomly selected centres from each state. The 2020 population projections were obtained from the National Commission of Population.

Findings:

Our database comprises a total of 9496 COVID-19 treatment centres which corresponds to 7 centres per million people. Of these 1761 were Dedicated Covid Hospitals (Category 1) for severe patients, 3472 were Covid Health Centers (Category 2) for patients with moderate symptoms, 3933 were Covid Care Centres/Dedicated Covid Care Centres (Category 3) serving mild COVID-19 cases while 330 couldn't be clearly classified. The maximum number of COVID-19 treatment centres were found in the State of Maharashtra with 4894 centres while Nagaland had the lowest count of 4 treatment centres.

Interpretation:

India did not have an adequate number of COVID-19 treatment centres relative to its large population. To our knowledge, this is the first such geodatabase that can help analysis of timely geographic access to COVID-19 management. Findings are cautioned by non-uniform health service delivery definitions and centre nomenclature.

Source of Funding:

None



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Background

Access to healthcare is a multifaceted concept with geographic accessibility to healthcare facilities being a critical component. We created a database of geolocations of the COVID-19 treatment centres for a more refined analysis of health access that can help identify inequalities in COVID-19 treatment accessibility in India.

Methods

Data Sources → Data arrangement → Data cleaning → Geocoding → ultimate verification

covidIndia.org	State-wise: 29 states & 7 union territories	Rooftop, Geometric Centre and Approximate	Google Maps API tool
Ministry of Health and Family Welfare (MoHFW)	Type of centres: Dedicated COVID Hospitals, COVID Health Centres, COVID Care Centres/ Dedicated COVID Care Centres	Duplicates based on the COVID-19 centre name and address removed.	Randomly 10% API tool geocoded centers were manually geocoded
COVID-dedicated state-level website	Rural & urban	Awesome Tables add-on	Selenium
		manual geocoding	

- COVID-19 treatment center data for some states of India like Kerala, Madhya Pradesh (MP), Himachal Pradesh (HP), Bihar, Punjab was difficult to extract and it is not completely included in this study as it is an ongoing project.
- On the basis of states and type of centres the data is organised and compiled. But for few states the categories used were some what different referred to as COVID isolation centre (CIC) in Uttar Pradesh and semi-dedicated COVID centre (SC) in Sikkim.
- Due to variation in the COVID treatment centre categories used by different states, there were few centres which couldn't be categorised.
- Binarized URCA rasters was used to check the particular centre lies in the rural or urban area.
- To get the data for COVID-19 treatment centres per million people in different states in India the 2020 population projections were taken into consideration and obtained from the National Commission of Population.
- The study is ongoing and data for few more states needs to be added.

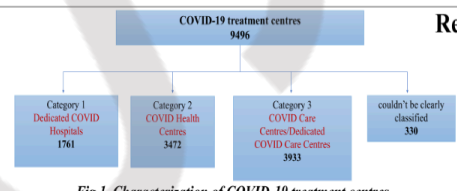


Fig 1. Characterization of COVID-19 treatment centres

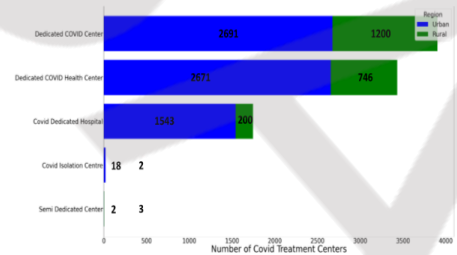


Fig 2. Rural-Urban categories of COVID care centres in India

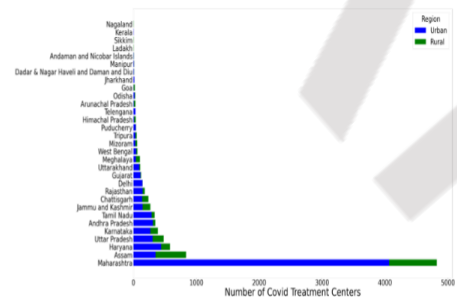


Fig 3. Statewise rural-urban distribution of COVID care centres in India

Results

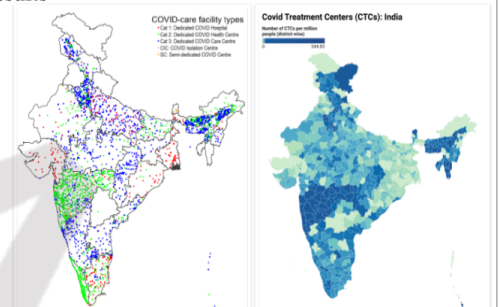


Fig 4. Geolocation of COVID treatment centers according to categories

Fig 5. Number of COVID treatment centres per million people in different states in India

Findings

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